



# The Not-So Rosy Periwinkle: Political Dimensions of Medicinal Plant Research<sup>1</sup>

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## Abstract

As pharmaceutical companies and conservation groups increasingly recognize the biomedical and economic potential of indigenous medicines from tropical rainforests, romanticized stereotypes of rainforest medicines as inherently beneficial abound. These ideas fail to take into consideration the question of why those living in the rainforest need medicines, and whether or not “traditional” medicines are a “choice” to those who do not have access to pharmaceutical medicines. This paper presents a theoretical analysis of how the study and practice of commodifying indigenous medicines has tended to exclude the structural factors shaping their use in indigenous communities, drawing on 14 months’ ethnographic research on access to medicines near the Ranomafana National Park in southeastern Madagascar. I suggest that researchers and practitioners of conservation and development consider the ways in which “modernizing” tropical rainforest communities shapes patterns of health and illness unevenly, thereby contributing to changing medical “traditions.”

## Introduction

There is a wonderfully goofy scene in the 1992 movie “Medicine Man” in which leading man Sean Connery, somewhere deep in the jungles of the Amazon rainforest, is hard at work in a make-shift open-air bamboo laboratory, his long scraggly gray hair marking him as an academic wizard long gone native. One half expects a gangly, giggling Gilligan to stumble over the coconut-shell bowls of wonder-drugs that the professor had so painstakingly laid out amongst the cauldrons and test tubes that litter his lab, bringing the experiment to a tragic but touchingly comic end. Instead, the lovely and intrepid program officer

whose agency has funded Connery (think Ginger in Banana Republic attire) has trekked through the jungle cursing and squealing all the way, to see what on earth he’s been doing with all their money. She is both dismayed and touchingly smitten to find long lines of natives carrying their sick children to the good doctor for a dose of the miraculous cancer cure that he has concocted from local plants and native wisdom. Given that cancer is not exactly the number one killer in tropical zones, the scene left me wondering why the writers couldn’t have had the indigenous inhabitants bringing their malaria-stricken children for treatment with a wonder drug they actually needed.

A similar perplexing scene was recently brought to the screen in the Dreamworks’ children’s movie “Madagascar,” where a trio of computer-animated zoo animals has washed ashore the Great Red Isle and encountered an anthropomorphic tribe of lemurs drumming and chanting like blood-thirsty warriors, preparing to battle the carnivorous **fosa** that threaten their existence. While it was refreshing that the movie-makers hadn’t made impoverished Malagasy farmers the foes that threatened the sur-

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vival of the lemurs, I was left this time wondering why the lemurs couldn't have been dancing to Malagasy music instead of the Caribbean beat of "Jungle Boogie," and why in the world the movie had to include the line, "People? If there were people on this island, it wouldn't be wild!" Despite its population of over 18 million, the image of the island as one uninhabited by people, just as the image of indigenous wisdom and rainforest medicines as romantic treasures needed to cure the cancers of the "developed" world, fits with certain cultural frames that shape our understanding of the tropical world, and it is through these understandings that social policies – and science – take shape.

Yet for all their ludicrous misrepresentations of tropical worlds, these movies are presented as entertainment and make no pretense at shaping public thought beyond Medicine Man's attempt to illuminate the importance of tropical medicines in improving human health. In contrast, while reaching a far more limited audience, but potentially having a far greater impact on public thought, are comments presented on The Textbook League (TTL) website. At the time of this writing, TTL "was established in 1989 to support the creation and acceptance of sound school books," and targets its publications to "classroom teachers, officers of local school districts, officers of state or country education agencies, and private citizens who take a serious interest in the quality of the instruction offered in the public schools." TTL's President, William J. Bennetta, known primarily for his vocal critiques against the teaching of creationism in the public schools, has pointed to Madagascar's Rosy Periwinkle as a classic example of environmental and cultural romanticism passing as science. In an article entitled "Rain Forest Claptrap," he writes,

The rain-forest claptrap in Holt, Rinehart and Winston's high-school book *Holt Health* is especially bad because the Holt writers try to kill two toucans with one stone. In an article headlined "Cultural Diversity: Medicines From the Rain Forest" they promote the common fancy that tropical rain forests are huge storehouses of pharmaceutical materials, and they also pander to the multi-culti mob by depicting rain-forest indigenes as medical savants (Benneta 1999).

Bennetta does raise an important issue concerning misconceptions about "rainforest" medicines. Popular conceptions of rainforest medicines are not necessarily based on empirical or scientific evidence, and while many indigenous healers possess a remarkable range and depth of knowledge about the biopharmaceutical properties of the flora and fauna in their environments, others may have very poor, if not potentially dangerous, knowledge of these properties.

Bennetta makes another significant point concerning Madagascar's famed "Rosy Periwinkle" (*Catharanthus roseus*

(L.) G. Don.), which has achieved such renown that it was adopted as the symbol for the National Cancer Institute's Research Symposium in 2003 (Tilghman 2004):

Various advocates for the preservation of the tropical rain forests have used *C. roseus* as a sort of poster plant and have falsely said that it is a rain-forest organism. . . . Propagandists also have distorted the history of the vinca alkaloids to spin a clever-aborigine tale: The discovery of the alkaloids is ascribed to scientists who received help from Madagascan [sic] witch doctors – witch doctors who, it is implied, had recognized that *C. Roseus* exhibited antineoplastic activity. . . . This tale exists in several versions. (Bennetta 1999)

He continues by providing examples from the Tropical Conservation Newsbureau on the role indigenous shamans of Madagascar (**ombiasa**) played in leading scientists to the discovery of the plant which has been found to be effective in the treatment of leukemia, Hodgkin's Disease, and other cancers. Bennetta's point, that because the "witch doctors" used the plant to treat diabetes, yet its biomedical efficacy and commercial value is associated with its tumor-inhibiting properties, leads him to conclude that only Western scientists should be credited with the discovery of the plant's true medicinal value. "Madagascan [sic] witch doctors were not in the picture anywhere" (Bennetta 1999). Indeed, it was not Malagasy healers who first brought attention to Western scientists of the plant's biomedical potential. Tilghman (2004) details how the plant's use for treating diabetes has been traced to both Caribbeans and Filipinos, rather than Malagasy, and that the plant grows throughout the world. Eli Lilly, the pharmaceutical company which has profited by an estimated \$160,000,000 annually from medicines derived from the Rosy Periwinkle, now obtains its supply of the plant from Texas (Tilghman 2004), while pharmaceutical companies throughout Europe, as well as others in the U.S., continue to import the plant from Madagascar, leading to "massive deforestation" for the cultivation of the Rosy Periwinkle for commercial export (Tilghman 2004:32).

Bennetta also points to the fact that Madagascar's Rosy Periwinkle is celebrated as a "rainforest" medicine, correctly noting that it is not endemic to the rainforest; it grows more commonly in secondary growth. This fact points to a common fallacy about the rainforest as a "storehouse" of wonder drugs. Instead of relying upon forests for their medicines, many people living in tropical rainforests are more likely to use medicines from recently cleared areas rather than "old growth" or "pristine" tropical forests. In a review of the literature on medicinal plant use in the Americas, Stepp and Moerman (2001) found that in all but a few cases, the vast majority of medicinal plants used by indigenous peoples come from disturbed areas, such as along roadsides or in secondary growth. They attribute

this disproportionate use of secondary-growth environments over primary forest to two likely causes. The first is the issue of accessibility. Most indigenous people live in cleared areas rather than primary forest, so they would be more likely to use those plants that grow closer to home, than those that require trips to the forest. Accessibility may be further shaped by cultural factors relating to who has access. In the case of Madagascar, where I conducted ethnographic research on access to pharmaceuticals and forest medicines in the southeastern rainforest region of Ranomafana from 1995 - 1996, I found that because premenopausal women are excluded from the forest, forest medicines were more commonly men's resources, while locally grown plants and weeds were more commonly women's medicinal resources (Harper 2002). Moreover, I found that because the village in which I resided was a virilocal one, in which women married and moved to their husbands' villages from geographically distant regions, women brought a diversity of medicinal plant knowledge, thereby contributing to the development of a broad range of indigenous treatments. At the same time, as women passed on this ever-changing syncretic medical wisdom to their daughters and sons, men passed knowledge of their lineage's prized and secret remedies to their sons, who would obtain their medicines from the same habitat (albeit an ever-shrinking one), as their ancestors. Thus, men and women possess differing knowledge domains of the forest in which they live, and the forest medicines they use. This differing access has also been noted by Shanley and Luz (2003) who observed that it is common for men to collect forest medicines, while women prepare them.

The other explanation Stepp and Moerman (2001) raise for the disproportionate number of medicinal plants found in secondary growth is that "weeds" are more likely to contain toxins, making them biochemically effective as medicines. Plants with long lives are more likely to develop immobile defenses, such as thorns, to defend against predators, while those with short lives are more likely to develop biochemical compounds. Because plants that rapidly colonize an area tend to be fast-growing and short-lived, they are more likely to contain chemical defenses against predators. These chemicals exhibit the bioactivity that makes them efficacious as medicinals. Madagascar's Rosy Periwinkle is among these fast-growing, short-lived "weeds" which exhibit the biochemical defenses that may be poisonous to an insect, but can be medicine to a human.

Clearly, while condemning research on tropical medicines as the fluff of a "multi-culti mob," Bennetta's own political agenda to defend the superiority of Western science over indigenous science is unmistakable, and has the unfortunate consequence of defending the unremunerated appropriation of medicinal plant resources and indigenous knowledge. And by dismissing indigenous Malagasy healers as "Madagascan witch doctors," unworthy of scientific attention, he comes across as less astute than Gilligan himself in grasping the potential for working with indige-

nous farmers and healers to learn the multitude of ways in which Western scientists can gain knowledge from those who live most intimately with the complex world of tropical flora and fauna. But his points that popular views of rainforest medicines are often unfounded and are shaped by romantic views of indigenous peoples as inherently wise are important ones. In this article, I explore these ideas, though toward far differing ends than those of Bennetta's.

Rather than viewing the celebration of tropical medicines and indigenous healers as "rainforest clap-trap," in this paper I argue that as Western scientists seek to gain knowledge of tropical medicines and indigenous healing systems, we should pay greater attention to the ways in which we can extend access to biomedicine to those who live in the tropics, so that their children will not be left with tree bark to treat malaria and herbal teas for tuberculosis, while we in the richer world exfoliate our faces with vanilla-scented bath salts and seek new psychotropic wonder-drugs to reduce our stress from urban living. After all, there very well may be cures for cancers and AIDS and the common cold deep in the heart of the Malagasy forests, and indigenous healers may very well lack the knowledge or capacity to develop these cures. But by doing away with the romantic notion of "rainforest medicines" as something "traditional" and therefore worth preserving for indigenous people, and reflecting instead on the health needs of those living in the forests as every bit as important as the health needs of the rainforest "ecosystem," the possibilities of discovering these drugs may be that much closer.

Toward this end, I draw on my ethnographic research in the Ranomafana National Park region of Madagascar to extend Bennetta's critique of the Rosy Periwinkle "poster plant," toward a more detailed and complex exploration of why showcasing forest medicines as cultural commodities to be celebrated and preserved, while simultaneously promoting development programs that radically alter indigenous cultures, can contribute to social inequalities that have potentially deleterious effects on indigenous health. While in many cases plant medicines may provide affordable and effective treatments for minor disorders, and merit their preservation and respect, in far too many cases these celebrated plant medicines may do nothing more than provide the poor a bit of hope before they die – of diseases for which we have already discovered and developed effective cures that those on the road to "development" in Madagascar (and beyond) cannot possibly afford.

## **Rainforest Clap-Trap Reconsidered**

A prevailing theme in the popular and academic press has been that the forest is home to countless health resources – specifically, medicinal plants used by forest people for treating diseases and wounds, as well as providing nu-

trition. And as Bennetta has correctly noted, Madagascar's Rosy Periwinkle is used indigenously to treat diabetes; discovered by Western scientists to be an effective treatment for childhood leukemia, it is frequently pointed to as an example of the medical value of tropical forest plants, suggesting that there are untold other plant species which can be used in the treatment of other cancers, heart disease and AIDS. In search of these undiscovered medicines, conservation planners and ethnobotanists are concerned with conserving the forest in order to preserve plant species, with exploring indigenous knowledge systems of how local forest products are used by healing specialists, and with investigating the cultural roles that plants play in indigenous communities.

To persuade local forest communities of this need, environmentalists often appeal to local communities to support conservation objectives by suggesting there is potential profit in local forest medicines. They often suggest that money can be made locally if plants found to be of value to Westerners – either for medicines, perfumes, or beauty creams – can be marketed nationally or internationally. By pointing to the botanical research on medicinal plants to legitimate this aim as globally beneficial because it is of benefit to science, once issues of intellectual property rights are negotiated and settled – if they are at all – the quest for scientific knowledge of the forests' rich pharmacopeia is regarded as inherently humanitarian and morally justified.

While botanical research of forest plants does indeed make a substantial contribution to scientific knowledge and the treatment of many diseases, the scientific process itself is deeply embedded in political concerns, not only in the questions that are asked – which plants are biomedically efficacious and therefore can be commodified – but in which questions are not asked. Tropical plants used for healing are related to the social, political, and economic factors that shape the use of medicines in forest societies, and they benefit or harm those who are dependent upon them in different ways. Why people living in the forest need medicines, why they select plants and not pills, or why they choose pills and not plants, and how the quest for medicine is related to changing ecologies, land tenure, social structure, and economics, are questions that invite further exploration – questions that are not regarded by many policy makers as relevant to understandings of how the forest environment is related to the health of forest residents. The end result is that forest residents are expected to depend on indigenous medicines for their health problems as if by "choice" or "tradition," at the same time they are called on to offer up their medicinal knowledge for sale or gift to outsiders, while receiving no comparable or real access to the pharmaceutical medicines of the industrialized world.

One reason issues of social structure, economics and politics are not considered by some as germane to the

anthropology of medicinal plant use, is that the marriage of botany to social science has in many respects focused on how plants are used and valued within the indigenous medical system. This focus has relied almost exclusively on either a biological framework (toward understanding the biological value of plant medicines), an interpretive framework (toward understanding the symbolic value of plants to those who use them) or a synthesis of the two (e.g. Balick *et al.*, Etkin 1988). Davis (1995) summarizes how the merging of ethnobotany and anthropology has evolved:

Increasingly as ethnologists joined the field, the emphasis shifted from the raw compilation of plant names and uses to an intellectual perspective that viewed the character of a people's relationship with the plant world as but one means of approaching an understanding of the cognitive foundations of a culture. . . . As anthropologists working in ethnobotany became concerned with the "totality of the place of plants in a culture" (Ford 1978), the intellectual potential of the discipline began to be realized. The study of plants became a vehicle for addressing general issues of ethnological significance. Several themes emerged. The important concept of cultural relativism was reinforced by studies of folk classification, which revealed that aboriginal taxonomies, while not necessarily coinciding with Linnean concepts and categories, were equally complex and firmly rooted in biology (Conklin 1954; Berlin *et al.* 1974). Studies of hallucinogenic plants offered insights into the origin and character of complex religious beliefs (La Barre 1938; Reichel-Dolmatoff 1971, 1975). Work in medical anthropology highlighted the significance of non-Western concepts of health and healing and, in doing so, emphasized the elaborate connection between spiritual belief, psychological predisposition, and pharmacology that underlies all indigenous practices involving psychotropic preparation (Davis 1995:43).

Although focusing on the biological and interpretive dimensions of botanical medicines provides critical insights into their local use, such a focus, when it remains isolated from the historical context and the political economy of medicine use, is problematic. Apart from a focus on biological efficacy, by conceptualizing the cultural context of medicines as the cosmological and social meanings of medicines, one is almost forced to think in terms of a shared concept of reality grounded in a common history and undivided interests. But social categories of class, caste, gender, age and ethnicity shape the social system in such a way that communities are united not just through shared interests and knowledge, but through conflicting ones as well.



By stepping outside the “medical system” to focus on individual and social differences, one is brought closer to understandings of power and the relationship between power and knowledge. Power permeates all dimensions of a society. These dimensions, however, are not distinctly bound. Medicine is fused with agriculture, just as agriculture is fused with religion. And these differing but interconnected social dimensions and power relations continually change. When explored in relationship to changing environments, social and environmental change are linked by concepts of power – who has, and who does not have, the power to mediate change? I ask this question to draw attention toward an understanding of how environmental and land-use changes (such as deforestation or the establishment of protected areas) do, in fact, change the use of forest medicines for different people, but not in uniform ways.

### **Disentangling “Culture” From the Culture of Medicine**

The role plants and other botanical resources play in the health and well-being of humans is indisputable. But beyond the immediate perceptions one may form regarding the contribution botany makes to society, there remain more subtle, and more complex, dimensions to this relationship. To understand this relationship in greater depth, one must consider the ways in which public perceptions of the relationship between forest medicines and society have been shaped by both academic and commercial concerns.

Much of the focus on the cultural context of medicines in indigenous communities subjected to conservation or development intervention is made by people trained in the natural sciences or public administration, who often conceptualize culture as something others have, something that is exotic, shared by all members of “the tribe,” and fixed in tradition. At best it is agreed that it is important. Indeed, in the best tradition of the missionaries of the nineteenth century, understanding culture is seen by many twentieth century international aid workers – hoping to “improve” economies, environments, and health – as a prerequisite to the success of changing that culture. In the following quote, a nineteenth century missionary suggested that ethnological knowledge of the Malagasy would facilitate enlightenment and economic change:

There still, however, remains a very marked gap in, at least, our English literature treating of the Malagasy ethnology: we know hardly anything definite about those numerous wandering tribes which are popularly known under the name of Sakalava. . . . Under enlightened and upright Hova governors, the Sakalava country would recover its prosperity, commerce would be opened up, and the vast agricultural resources of the

western provinces would be developed. And last, but not least, Christianity would be introduced, and the people lifted up from their present heathen condition into the light and liberty brought by the Gospel of Christ. We still, however, need much information about the Sakalava tribes (Sibree 1878:456-457,468).

One hundred and sixteen years later, a United States Agency for International Development (USAID) report reflects little change:

Local customs, traditions and cultural variations can be an obstacle to both conservation and development objectives. The RNPP [Ranomafana National Park Project] will make every effort to identify these forces and work with the recognized community structures to accomplish the objectives that benefit both the communities and the park. Local knowledge will be incorporated into all aspects of the project to heighten the chance of success of activities (RNPP 1994:86).

These quotes, which are typical of development discourse, suggest that the way the concept of culture has been employed by those seeking to “understand” other cultures has not necessarily been toward the enlightenment of outsiders, as much as it has been viewed as something to be done away with and replaced with the cultural paradigms of more politically powerful groups. Such a view is directly at odds with anthropological concepts of culture, in which preservation of cultural integrity is a primary concern, with culture seen as “that complex whole” that includes economic structures, social organization, cultural institutions, and power relations, in addition to “traditions” and symbolic systems. Understanding the distinctive ways in which the term and concept of “culture” have been used by people from varying disciplines and professions may clarify anthropological approaches to the study of culture, health and the environment.

There are two primary ways that forest medicines, or medicinal plants, are viewed by those who do not live in the forest (whom I term “outsiders”). One view regards forest medicines as resources to be commodified. As the multinational pharmaceutical industry expands its drug marketing globally, the commodification of tropical resources by capitalist enterprises also accelerates. With this expansion of the profit-oriented medicine industry, the concept of “traditional” has been reduced to that which is of little or no economic value to industrialized nations.

At the same time, ecologists and ethnobotanists present a second view. In the name of biodiversity and as a strategy and goal of sustainable development, they call for researching and preserving traditional medicines, and the indigenous knowledge systems concerning their use. McCaleb (1997:221), for example, suggests that plant

medicines may be the only sustainable form of medicine, because it is not only readily available to people in the “developing” world, but because it also has a rapidly growing market in the industrialized world.

Warren (1997) indicated that research on the medicinal properties of plants is integrally linked to sustainability of environmental development through a focus on indigenous knowledge. Indigenous knowledge, he argued, is an important national resource; by recognizing intellectual property rights to profits from medicinal plants, and by including those knowledgeable as participants in the commodification and marketing of plants, medicinal plants become a key symbol to sustainability.

While the sustainability and equitable distribution of profits from bioprospecting and commodifying indigenous medicines is both ethical and crucial, this line of intellectual query ignores the economic benefit forest residents may receive from burning the forest, leading to health benefits which in many circumstances may offset the loss of medicine. Consequently, the local context in which forest cover is intentionally cleared must be considered along with ethnographic inquiry into how medicines are used by forest residents. Et-kin (1996:163) draws attention to the significance of exploring the local context of how indigenous plants are used both for medicine and for nutrition:

At present, the rate and extent to which genetic resources are being depleted worldwide threatens species extinction to an extent never before experienced in human history. This issue has become increasingly politicized as resources, largely of the “developing” world, are deliberated from a variety of Western postures, predominantly economics (Morowitz 1991). “Important” or “interesting” species tend to be defined by politics that are culturally and politically not engaged with the threatened environments and the people who inhabit them. Thus, the value of particular taxa has not been adequately assessed in the local contexts of their use. Instead, conservation efforts generally focus on food crops, ignoring “wild” foods and other resources – notably medicines and other plants whose salience does not bear directly on the expertise and interest of outsiders. Some recent efforts to address biodiversity issues through a focus on medicinal plants (e.g., Farnsworth and Soejarto 1991) still betray a Western bias that values knowledge of plants for potential development by the pharmaceutical industry.

Without such ethnographic understanding of the local context, the extent to which the loss of plant medicines affects those who live in the forest is not clear. More attention has been drawn to the potential “global” loss of medicines – that is, the loss to biomedicine and pharmaceutical corporations

– that deforestation might cause, than to how loss of forest biodiversity is or is not associated with the loss of medicines for forest residents (e.g. McCaleb 1997, Plotkin 1993, USAID 2001, World Bank 1994).

This focus on the preservation of biodiversity as a morally righteous objective has indeed been seized by the pharmaceutical industry seeking Third World resources for First World drugs. Their focus on “traditional” medicine has two objectives. One, to gain knowledge about the unknown medical system in order to appropriate both the knowledge and the resources for profit, and two, to gain knowledge about the unknown medical system in order to tap new markets for pharmaceuticals. This knowledge and these resources thus obtained become “modern,” whereas what is left behind as of no use, or what remains undiscovered by biomedical researchers or unfamiliar to them, is “traditional.” This dichotomized ideology presumes that there is no tradition in modern allopathic medicine, nor anything modern in indigenous medicines.

To bridge this gap, some medical anthropologists have called for more attention to medical pluralism, as opposed to studies of medical “systems.” While Stoner (1986) has charged that the “medical systems” have become dichotomized as “folk” or “modern,” ignoring the multiple forms of medicine that practitioners employ to heal the sick, Comaroff (1983) and Stoner (1986) have critiqued the concept of medical system itself for the ethnocentric bias inherent in separating the medical from other social dimensions. Comaroff charges that the scientific quest for categories (within the medical system) is itself ethnocentric in that it presumes such categories to exist, and that the distinction of various social domains, such as religious, economic, or medical, are recognized as separate domains among the people whose medical system is studied by the ethnographer.

Baer *et al.* (1997) suggest that medical pluralism is not indigenous to pre-state societies, but is instead, directly associated with increasing social stratification. They indicate that the role of shaman is central to the dyadic core (healer-patient relationship) in simple preindustrial societies, whereas in horticultural societies one finds multiple specialists utilizing varying components of the folk medical system. In industrial societies, the authors suggest, the biomedical physician dominates a myriad of medical systems. They further contend that the concept of medical pluralism is perhaps better understood as medical dominative systems, in which biomedicine dominates all other systems.

While not disputing the association between increasing levels of social stratification and increasing medical specialization, I would suggest that this view reifies in some respects the folk/modern dichotomy by its reliance on subsistence strategies as boundaries separating “simple preindustrial” foraging, horticultural, and state industrial societies. In reality, multiple subsistence strategies are practiced in all soci-

eties and all societies have been incorporated into states. Moreover, although certain subsistence strategies may predominate in societies, this does not necessarily mean that they are uniformly practiced by all community members.

### Quests for Medicines Near Ranomafana National Park, Madagascar

The Ranomafana region of southeastern Madagascar provides a telling example of how misconceived ideas of culture obscure useful understandings of how medical systems are associated with economic systems. The Ranomafana National Park was established in 1989 to protect endangered native species and preserve forests threatened by swidden ("slash and burn") rice farming; the Ranomafana National Park Project (RNPP) was established the following year as an Integrated Conservation and Development Program (ICDP) funded by USAID to manage the park.<sup>2</sup> While indigenous farmers have been prevented from continuing their "cultural traditions" of swidden farming (**tavy**) and entering the forest, pharmaceutical research on medicinal plants is encouraged as a form of sustainable development. Local residents have been characterized as practicing "traditional" farming methods, and characterized according to perceived ethnicity as either Tanala or Betsileo. The Tanala have been characterized as "traditional" **tavy** farmers, reluctant to change their ways, while the Betsileo have been characterized as more "modern" wet-rice agriculturalists and more amenable to "modern" farming methods and lifestyles (Harper 2002). Along with these characterizations, local Malagasy are viewed as practicing "traditional" medicines, one of the few cultural practices that the Project has regarded as worthy of respect (Harper 2002, RNPP 1994), while use of pharmaceutical medicines and biomedical health care, which is virtually unavailable to the majority of residents, is regarded as a marker of modernity.

Yet all local residents are tied to the market and tied to the state, and engage in multiple subsistence strategies, from foraging to irrigated agriculture; these practices, in turn, affect their health and access to medicines in different ways. A series of economic strategies, including structural adjustment programs imposed by the World Bank, the prohibition of forest farming and other uses through the establishment of the park, and poorly planned development projects all contributed to intensified poverty for the majority of residents, while a few residents benefitted substantially (Ferraro 2002, Harper 2002). During the fourteen months in which I resided in one of the RNPP pilot villages (targeted for development projects), ten percent of the village population died, most of them from what were seem-

ingly treatable diseases such as malaria and tuberculosis, while project administrators did nothing to explore any possible connections between these economic changes and the high death rate, regarding the deaths as "natural" and the residents as practitioners of "traditional" medicine and hence, unwilling to seek "modern" health care (which was unavailable to most of them). Through a "willingness" to "modernize," and more specifically, use pharmaceutical contraception, residents would become more healthy, project administrators reasoned.

To classify the Malagasy as practitioners of folk and/or modern medicine, as they have been by project administrators (Harper 2002), is as misleading as classifying them as swidden or irrigated rice agriculturalists. Their society has, nonetheless, changed significantly as wage labor becomes far more central to the economic base, at the same time residents have resisted efforts by outsiders to abandon foraging and horticultural practices in favor of irrigated agriculture. In other words, while the organization of labor is rapidly changing, the mode of subsistence is changing at a much slower pace. The increasing social stratification in the Ranomafana region that has ensued is more closely related to the changing structure of the economy than it is to the mode of subsistence, or infrastructure. It is this changing economic base, I argue, that is contributing to medical pluralism and inequalities in health and well-being, rather than the shift to irrigated agriculture per se, or the process of "modernization."

Biomedicine may well predominate in stratified societies, in that it is more desirable for certain people in the treatment of certain disorders, but it does not always predominate, even in industrialized countries where "alternative" "natural" and "folk" medicines or health care are commonly utilized by members of all social strata. Likewise, while an emphasis on the hegemonic influence of biomedicine, particularly with regard to the commodification and distribution of pharmaceuticals, is important to understanding how biomedicine is incorporated into post-colonial societies and viewed by community members, such an emphasis can obscure an equally imperative emphasis on how biomedicine is often superior to plant medicine in treating many critical health issues – notwithstanding the fact that it is often injurious as well. It is for this reason that the World Health Organization (1988) has called for the equitable distribution of essential medicines throughout the globe.

Nonetheless, distinctions of "folk" and "modern" continue to be reproduced by the professional and popular cultures, and are put into practice by many physicians, development workers, and corporate investors, as they gaze upon medicines as tools toward their respective ob-

2. Management has since shifted to the World Bank-funded Association National pour la Gestion des Aires Protégées (National Association for the Management of Protected Areas).

jectives. Yet rather than remaining in discreet domains of folk or modern, pharmaceutical medicines have freely entered into indigenous medical systems with the same ease in which herbal medicines find themselves stocked alongside aspirin and antihistamines at the local Rite Aid. In Madagascar, I found “calcium” was regarded by many as a general nutritive supplement to ward off disease. At the same time, antibiotics were regarded as an all-purposes cure-all for everything from malaria to sickness sent through witchcraft (the latter requiring, of course, the additional medicines of an **ombiasa**, or diviner/healer). Over a decade ago, van der Geest and Whyte (1988:10,11) alluded to this problem of syncretic medical systems challenging our cognitive categories:

In situations of pharmaceutical pluralism, terms like “traditional” and “modern,” “indigenous” and “Western” medicines are almost unavoidable. So are the quotation marks around these terms. There is an uncomfortable sense that they are misleading, since the pluralistic context transforms both imported and native medicines. Thus we find “modern” medicines being distributed by “traditional” healers and utilized in ways never imagined by the manufacturers. Penicillin may become an ancient Ayurvedic medicine. And we see “indigenous” medicine being manufactured on an enormous scale advertised on television, and exported to other countries. Genuine **jamu**<sup>3</sup> from Indonesia can be purchased in Europe. The nuances involved here may serve to remind us once more of the care needed in the use of terms like traditional and Western medicine.

Concepts of “traditional” medicine are not just imposed on indigenous societies by outsiders from the industrialized world. They are just as likely to be perpetuated by outsiders from within post-colonial nations – that is, urban-based, Western-educated elite. Feierman (1985) suggests that there is an assumption in the medical anthropology research that “traditional” African medicine is something that “traditional” Africans do. This assumption is facilitated, in part, by the social status of those Africans who write about African medicine. Feierman points out that focusing on the competition between popular and biomedicine draws attention away from more critical questions, such as how are social costs distributed, what is the relationship between production and health, and how do social changes pattern health and disease?

Despite the convenience of distinguishing between “traditional” and “modern” medicine, and despite the seeming contrast between the domains, it is important to explore the political and economic forces that shape any concept of “medicine.” In so doing, it becomes apparent that re-

gardless of whether a medicine is found in the backyard or in a child-resistant plastic bottle, medicines are resources, and as resources, distinguishing them according to their material form may not tell as much about the person taking them as does distinguishing them in terms of their political and economic form. Taussig (1980) has shown how the social products of our world become so naturalized that the social order related to their production and commodification escapes our senses entirely. Indigenous medicines are symbolic of a social order that extends beyond the natural world into the world of medicines as profit.

Nonetheless, the political and economic forms of medicine used by forest residents are rarely addressed by those who study them, except to the extent they are presumed to be profitable. This is because a second view many bring to the study of forest medicines is deeply embedded in Western views of what constitute such medicines. This is the view that forest medicines – primarily conceptualized as plant medicines – are natural healing agents from the forest’s rich cornucopia of biodiversity. They are, as such, “good things,” “natural,” and potentially enriching both in terms of health and wealth.

A growing segment of the public believes that herbal medicines and other alternatives are safer, possibly more effective, more natural, and more in harmony with a lifestyle that promotes self-care, individual responsibility, freedom of choice, and “holistic” thinking. A part of this too is the belief that a return to more natural therapies is a return to the time in which our medicines, like our foods, came from the earth, and the use of these natural substances is more in harmony with our natural surroundings (McCaleb 1997:228,229).

A third view is that increased population pressure leads to increased deforestation of the tropics; as forest residents increase swidden agriculture on a limited land base, they encroach on old growth rainforests. This view is advanced by many conservation and development planners who are concerned with halting the destruction of tropical forests, and is central to the environmental and health policies of the World Bank and the United States Agency for International Development. This view holds that if women who live and work in tropical forests adopt family planning practices, and have access to improved prenatal and infant health care, forest populations will decrease, and forest residents will no longer need to clear more forested land. This idea focuses more on how the health of people affects the health of the forest, presuming as well that what is good for the forest (conservation) is good for its inhabitants.

**3. Jamu** is an indigenous medical system of Indonesia, and employs herbal medicines as a primary mode of illness treatment.



Conservation planners and ethnobotanists consequently are concerned with conserving the forest in order to preserve plant species (e.g., Middleton *et al.* 1993), with exploring shared indigenous knowledge systems of how local forest products are used by healing specialists (e.g., Naranjo 1995), and with investigating the cultural roles that plants play in indigenous communities (e.g., Alcorn 1995).

Throughout the world, the pharmaceutical industry and others have capitalized on the conservation movement in order to maximize profit. Yet the merging of the objectives of the pharmaceutical industry with those of environmentalists is commonly represented as being so potentially fruitful, that an alliance which in decades past would have struck many as inherently conflicting, is now viewed by many environmentalists as symbiotic and "natural."

Among the companies which have embarked on major medicinal plant research programs are Merck, Bristol Myers, Squibb, Pfizer, Monsanto, Smith Klein Beecham, and Eli Lilly. The interest of these companies in as yet undiscovered medicinal plants – or rather, the compounds from medicinal plants – is a testimony to the importance of preserving biodiversity as a source of future medicines.

This area of research on the part of ethnobotanical science has also been criticized for its focus on the commercial potential for Western profit, in which the research itself is value laden but couched as "universal" benefits by way of "discovering" potential cures for disease (Davis 1995). Nonetheless, as Gare (1995:79) points out:

Through treating things as commodities, the natural conditions for human creativity become private property and are then treated as capital, while people's creative potential is reduced to labor power to be bought and sold on the market.

Nowhere is this truer than in the focus on plant medicines as having monetary value. Such a focus on how plant medicines can be commodified is intended to transform the labor of local communities toward just such ends. Medicines viewed as economic resources, exclusive of their social and symbolic resource value, are in this way synonymous with medicines as property, to be bought and sold for profit, and the local medical experts reduced to labor power.

As countries like Cameroon begin to see the economic value of the medicinal plants in their forests, they can better appreciate the foolishness of clear-cutting those forests for timber, ranching, or mining. In fact, one of the strongest hopes we have for saving the ancient forests is that their true economic value will now be recognized (McCaleb 1997:236).

According to the U.S. Agency for International Development, the greatest challenge facing most farmers in developing countries is finding markets for crops with sufficient value to sustain a family business. In many parts of the world, agroeconomic development has shifted away from subsistence farming toward the search for specialty crops and cash crops which can be grown on farmland which is currently idle (McCaleb 1997:234).

Thus, the view of forest medicines as inherently good and natural goes hand-in-hand with the global marketing of forest medicines. Yet globalization contributes to increasing social inequality throughout the world (Gunter & van der Hoeven 2004), and the increasing reliance on a market economy, along with the deleterious effects of structural adjustment policies on Malagasy farmers, has rapidly intensified social inequality in Madagascar (Hanson 1997, Harper 2002). Nonetheless, current environmental policies in Madagascar largely ignore social differences and local and national histories in favor of simplistic views that swidden rice production is destroying the forests, it is practiced due to tradition and poverty, and that by educating forest farmers in the practice of irrigated rice production, and increasing their integration into a market economy, they will act rationally which is to say, adopt the new technology and abandon their (irrational) cultural tradition (RNPP 1994, USAID 2001).

Likewise, the World Bank presumes that by investing in human resources, such as health and education, the economic goals of promoting a free market economy in post-colonial nations will be achieved:

Experience has shown that farmers who have had some primary education achieve higher yields, because they are more receptive to modern methods and are better able to communicate with their suppliers. . . . Health also has obvious impacts on productivity – healthy farmers can work harder, go further to markets, and so on (World Bank 1994:23).

In short, the linking of health and environment is tied to economic objectives which very much mimic the objectives of colonial states which promoted health and reproductive care in order to ensure a productive labor pool. These ideas, that agricultural or health practices are tied to tradition and custom, and can be untied through Western education and introduction to the modern world of technology and chemistry, remain top-down. They do not constitute a form of "cultural exchange" in which education is seen as reciprocal, and indigenous views, behaviors and objectives are regarded as rational, without necessarily being in need of change by outsiders. Instead,

tradition is invoked as an obstacle to modernization.<sup>4</sup>

Generally, educating the people was seen as a crucial prerequisite to development. Education in fact plays a huge role in how people see environment and how willing they are to try something new. In a society where the ancestors are of tremendous importance and traditions are greatly respected it is difficult to reason why old practices should be changed. Through education and raising the general state of awareness it is more likely that the old ways will be questioned and changed. People seem to look back more than forward, which is common in agricultural societies. Planning and creating future schemes are not part of the culture. Also a great belief in faith prevents people from talking full responsibility of [sic] their actions and their lives (Lappalainen 2002:51).

The fixing of people's beliefs and behaviors as traditional further presumes that they lack the ability to make choices without enlightenment from outsiders (Feeley-Harnik 1995). The desire to reap the rewards of the market economy, however, is presumed to be so universally innate that a project need only facilitate its integration into local economies in order for the culturally-bound native to "choose" to participate.<sup>5</sup>

Based on the knowledge that the African environment and rural economic growth are inextricably linked USAID programs focus on helping African countries get the conditions right for broad scale investments in practices and systems that increase productivity and reduce environmental degradation (USAID 2001:1)

The principal U.S. interest in Madagascar lies in the high potential of its people to break out of poverty to become one of Africa's emerging market economies, thus enhancing its ability to manage its globally unique biodiversity. Assistance to Madagascar serves U.S. interests by helping establish a legal and policy environment that encourages private initiative and investment, foster

greater respect for human rights and the rule of law, and increases decentralized responsibility for decision making. Assistance to Madagascar also advances U.S. interests by helping the Malagasy people to manage effectively one of the earth's most extraordinary sources of biodiversity. . . . All of these factors contribute to integrating Madagascar into the world economy and in turn building its capacity to assume a greater partnership role in support of United States interests (USAID 2001:1).

The potential for economic gain from the rainforest has not been overlooked by those seeking to conserve it.

As noted earlier, the importance of Madagascar's indigenous plants to international pharmaceutical research and development is well documented. The Malagasy periwinkle, containing a chemical used to treat Hodgins [sic] disease and childhood leukemia, benefits millions of people worldwide. Natural chemical compounds found in many plant species provide vital components for the treatment of disease. Because of the tremendous plant biodiversity found in the remaining rainforests, it is likely that plant species known by western science to be biomedically efficacious, or species which are as yet undiscovered or unexplored by western scientists, exist in the Ranomafana area (RNPP 1994:35).

What such promotional campaigns for research and development fail to address, however, is that the commercial potential of medicinal plant bioprospecting rarely extends to those communities most impacted by conservation efforts. As Tilghman (2004) has shown for Madagascar, and others (e.g. Brush & Stabinsky 1996) have shown throughout the world, intellectual property rights and distribution of profits are complex and contentious issues, with disputes over ownership and proprietary rights challenged locally, nationally and internationally, leading to ethical and legal controversies far beyond the scope of this paper.

4. This is not to suggest that all cultural practices or "traditions" are inherently superior to "modern" ones, nor that "modernization" is inherently bad. Indeed, the central argument of this essay is that access to the benefits of modernization ought to be more equitably dispersed, and that in many respects modern pharmaceutical medicines are far more efficacious than indigenous medicines. Nevertheless, modernization is too often conflated with increasing consumption of Western goods and incorporating indigenous peoples into a low-waged labor pool that fails to provide subsistence, while profits from the resources and labor of indigenous communities leave the community and all too often, the nation and continent.

5. Integration into a market economy was central to the development objectives of many Integrated Conservation and Development Projects (ICDP's), including the Ranomafana National Park Project, and continues to be the foundation on which conservation aid from the United States is based. Further integration into the market economy, and hence, consumption of resources, is regarded as something that will contribute to the conservation of resources.

## Let Them Eat Plants: Medicines and Human Rights

Physician and anthropologist Paul Farmer has pointed to the ways in which “cultural” explanations are offered to account for health treatment strategies that obscure social inequalities preventing many people from accessing modern medicines. In discussing the case of a young Haitian woman suffering from malaria, and whose father had her removed from a health clinic because he believed her illness was caused by witchcraft, Farmer asks:

Do these events speak to the power and integrity of Haitian cultural traditions? Or do they point instead to inequalities of access which mean that, in rural Haiti, understandings of acute infectious disease even now evolve largely in the absence of effective interventions that are readily available to non-poor Haitians? Is Marie's a story about rural “beliefs” or rather a story about poverty and its effects on health outcomes among people who share her circumstances? I've spoken about “selective blindness.” When an observer witnesses the effects of structural injustice and sees little more than cultural difference, is this not a conflation of cultural difference and structural violence? (Farmer 1999:154).

The tendency to view indigenous systems as passively responding to the pressures of capitalist society is also reflected in medical anthropology studies of indigenous societies that romanticize indigenous medical practices as innately practical, beneficial, and adaptive, while capitalist medicine, or biomedical systems, are portrayed as innately impractical, harmful, and maladaptive. For example, while detailing the many ways in which indigenous Mayan childbirth practices provide a culturally-appropriate and woman-centered birthing experience, Jordan (1993) indicts biomedicine for creating a childbirth experience that ignores the needs and concerns of women, relies almost exclusively on biomedical technology that is presented as more harmful than helpful, and subordinates the knowledge of the indigenous practitioner, or the woman giving birth, to the authoritative knowledge of the biomedical practitioner. Her critiques are important ones and her cross-cultural analysis (in which she compares birthing systems in four different cultures) is both rare and enlightening. But as Rhodes (1996) has shown, biomedicine is itself a cultural system, and as such, it merits respect and consideration. By drawing such broad conclusions about biomedicine, as Jordan did, one disregards the ways in which biomedicine can improve infant and maternal mortality and health. With up to 300,000 women in indigenous societies dying from complications associated with “natural” child birth each year, the issue of human rights may be more pressing than that of cultural relativity or even cultural survival when analyzing

indigenous medical systems in the context of capitalist medicine (see Farmer 2005).

In more recent work, anthropologists drawing on political economy of health approaches, or critical medical anthropology, have recognized that as much as biomedicine is a hegemonic cultural system, it is also in many ways, an efficacious one. For example, Millen *et al.* (2000) suggest that globalization has intensified social inequality, and that health indicators provide the most telling evidence for the uneven effects which economic and political changes have had on the world's population. They indicate that as technology and knowledge have increased significantly in the field of health, access to this technology and knowledge remains limited to certain groups of people. For those who lack such access, health care is not only limited, but health status remains low. For example, malnutrition affects 11.2 million people in the United States, and 828 million in post-colonial societies. Recognizing that proper nutrition helps to prevent disease, the authors point out that half of the 31,000 children under five who die each day, half die from hunger-related causes. In Africa, these rates have more than doubled since the mid 1980's, a period which coincides with the introduction of economic liberalization and structural adjustment programs.

Millen *et al.* (2000) conclude that indicators of economic growth must include health indicators, and that these indicators must consider multiple criteria, such as access to safe drinking water and sanitation, safe and appropriate housing, and disease prevention. Utilizing aggregate statistics to portray overall health status of a population may obscure the ways in which gains in some areas are offset by declines in others.

Contrary to presenting biomedicine as a hegemonic medical system that undermines indigenous medical systems, Kim *et al.* (2000) present a number of case studies drawing on a political economy of health perspective which contend that biomedicine saves lives, and that political and economic development which intensifies the separation of the rich from the poor and makes access to this biomedicine the privilege of the minority, is untenable and immoral, a point that Farmer (1999) eloquently makes in his discussion of how treatable infectious diseases such as tuberculosis continue to kill millions of poor people every year.

While Morsy (1996:27) suggests that connecting “poor health to the inaccessibility of “Western” medicine obscures the connections between the local, national and international levels,” Kim, *et al.* (2000) contend that inaccessibility to pharmaceutical medicines does contribute to poor health, and that lack of such medicines alone does not explain poor health. Other significant processes contribute to poor health, including economic changes imposed by national and international governments and

institutions, as well as local power relations, and the cultural context in which the body and the environment are experienced and made meaningful.

Conceptualizing “forest medicines” or “indigenous medicines” therefore requires acknowledging the political, economic, and structural forces that accompany “tradition” and lead one group of people to rely upon plants to treat life-threatening disorders, while access to Western pharmaceutical medicines is denied them. For example, I found that while chronic illnesses were more likely to be treated by pharmaceutical medicines among forest residents who had access to land and labor, those who lacked such resources were more likely to ignore chronic illnesses, often leading to early death. At the same time, even those with access to land, labor and pharmaceuticals, died from acute disorders, such as those that appeared to be liver disorders. The profound disinterest of RNPP management in exploring the factors contributing to these illnesses and deaths, however, limited any conclusions that could be made.

Finally, in order to understand the suffering that indigenous medicines are intended to treat, one must include the social suffering that accompanies the suffering of the body when the patient knows full well that when sick, the indigenous healer may draw on the same pharmacopeia as the patient, but the Western physician’s own ailments are treated from a broader range of medicines often times more likely to cure but less likely to be provided to the poor, due to international pricing mechanisms beyond the control of the Western healer (see Farmer 2005, Kleinman 1997, Kleinman *et al.* 1997).

## Conclusion

In this paper, I have argued that Bennetta (1999) makes a valid point in challenging the romantic notions of tropical rain forests as pharmaceutical wonderlands and local healers as medical savants, but find his generalizations to be ethnocentric justifications for disregarding the rights and knowledge of those who live in the forest. Rather, I have suggested that while indigenous medicines may not necessarily come from rainforests to the extent many believe, and that indigenous healers may or may not have extensive knowledge of the native pharmacopeia, there remains a need to reconsider the ways in which the cultural context of medicinal use is conceptualized in popular culture and by development and conservation planners.

More specifically, I have suggested that the concept of culture must be refashioned from the popular realm of all that is exotic and different, that which finds its way into Hollywood movies, National Geographic magazines, and middle-class home decor, and instead become more fully appreciated through contemporary anthropological approaches to culture which include a focus on social struc-

tures and relations, and their linkage to national and international political and economic networks and institutions. In other words, when talking about “ethnomedicine” or “traditional medicine,” we might gain keener insights into indigenous practices by considering how changing economies and social relations contribute to changing health-care needs, and changing access to health resources. Moreover, through such a focus, it becomes clear that different people have different health needs in rainforest communities, and draw on differing medicines and treatments, thereby dispelling notions of “traditional” medical practices among non-differentiated “natives” (see Etkin 1996:162-163 for a discussion on syncretic medical systems). Such differences are significantly influenced by social factors such as class, caste, gender, and age, and not just “ethnicity,” or “tradition.” As such, concepts such as “medical systems,” are not bounded systems related exclusively to healing and religious beliefs, but also include agricultural and other economic systems, with complex histories and linkages to the state and international institutions that shape health and health care in multiple ways.

At the same time, I have argued that in our efforts to respect intellectual property rights in the most equitable manner possible, the industrialized world may very well benefit from the knowledge and resources of the tropical world. But without extending the medical knowledge and resources of the wealthiest sectors of the world -- and access to these resources -- to those who live in the forest and treat their diseases with plants instead of pills, we will inevitably fall short of reaching any equitable or ethical intellectual exchange.

Finally, as our efforts to explore “tropical” medicines and health continue, we must extend the concept of “culture” to include the changing culture of the developed world, and reflect upon the multitude of ways in which “development,” “conservation,” and “globalization” foster social inequalities that exacerbate or cause poor health and death for so many in the rainforests of the world. “Modern” medicine clearly saves lives, and I’ve yet to meet an American or European advocate of “traditional” medicine who would celebrate the use of leaves or tree bark for their own bout of scabies or their own child’s malaria, but at the same time, the ways in which people are “modernized,” shapes the ways in which “traditions” are employed and perceived.

While Bennetta (1999) might regard “rainforest clap-trap” as a justification for dismissing the concerns of those living in the rainforest, I would suggest that “rainforest clap-trap” is all the more reason that the needs of the world’s poorest peoples -- many of whom live in tropical rainforests -- be prioritized over the needs of the endangered biodiversity of the tropics. What for Bennetta may be “clap-trap,” is an image that has captured the hearts and imaginations of many in the developed world for whom rainforest remedies are more than likely decoratively-packaged



lotions and oils that help our skin to glow, and ease our minds that the inflated price we may have paid will benefit a small tribal village very far away. The reality is that our ability to purchase rainforest remedies in the "developed" world has been made possible by a long historical process of conquest and domination of the tropical worlds and their peoples. To truly extent human rights to those living in the "endangered" rain forests that remain, those of us in the richest parts of the world might ask how the medicines we use can be made more readily available to indigenous peoples, rather than how their medicines might be made more readily available to us.

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